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Nuclear PDFs with Neutrino DIS data - a compatibility analysis from nCTEQ

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We present a global analysis of neutrino DIS cross-sections in the framework of nuclear parton distribution functions (PDFs). In our previous analysis (circa 2011), we concluded that some neutrino DIS data, particularly from the NuTeV experiment, were incompatible with the remaining nuclear scattering data. We have now performed a follow-up analysis that improves the previous study in many respects. For example, we have included all available neutrino DIS cross-section data from CDHSW, CCFR, NuTeV, and Chorus experiments alongside the di-muon semi-inclusive data. We have also improved the treatment of correlated systematic errors, and above all, we have included numerous important updates to the nuclear parton distribution functions accumulated across the past 10 years. In this contribution, we discuss the new updated global analysis of nuclear PDFs, including the neutrino data, and examine the tensions between different data sets encountered in the course of the global analysis. Understanding the tensions between the neutrino and charged-lepton DIS data is essential not only for a better flavor separation in global analyses of nuclear and proton PDFs, but also for neutrino physics and the searches for physics beyond the Standard Model.

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Primary author: RUIZ, Richard (Institute of Nuclear Physics (IFJ) PAN)

Presenter: RUIZ, Richard (Institute of Nuclear Physics (IFJ) PAN)

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